

CLAIMS

What is claimed:

- 5 1. A device for characterizing construction materials, comprising:
 - (a) a metal ring;
 - (b) at least one strain gauge attached to said metal ring; and
 - (c) a processor in communication with said at least one strain gauge for recording and processing data from said at least one strain gauge.
- 10 2. The device of claim 1, further comprising a mold for forming a test specimen.
3. The device of claim 2, wherein said mold further comprises:
 - (a) a substantially flat base plate;
 - 15 (b) a centering plate mountable on said base plate; and
 - (c) a first specimen support and a second specimen support mountable on said base plate and defining a gap between said centering plate and said specimen supports for accommodating said test specimen.
- 20 4. The device of claim 3, wherein said centering plate further comprises a plurality of apertures passing completely through said plate and wherein said mold further comprises at least two dowel pins mountable to said base plate for stabilizing said centering plate by passing said dowel pins through said plurality of apertures.
- 25 5. The device of claim 3, wherein said specimen supports are secured to said base plate by a plurality of shoulder bolts.
6. The device of claim 1, further comprising at least one thermocouple attached to said metal ring, and wherein said thermocouple is in communication with said processor.
- 30 7. The device of claim 1, further comprising at least one module for amplifying the signal of said strain gauge, and wherein said module is in communication with said processor.
8. The device of claim 1, further comprising an environmental chamber for controlling the temperature to which said device and said materials are exposed.
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9. The device of claim 1, wherein said metal ring is an aluminum ring having an outer diameter of about 50.8 mm, a height of about 12.7 mm, and a thickness of about 1.65 mm.

10. The device of claim 1, wherein said construction material is asphalt binder.

5 11. A system for characterizing construction materials, comprising:

(a) a metal ring;

(b) at least one strain gauge attached to said metal ring;

(c) at least one thermocouple attached to said metal ring;

10 (d) at least one signal amplifying module in communication with said strain gauge and said thermocouple;

(e) a processor in communication with said signal amplifying module for recording and processing data from said strain gauge and said thermocouple;

(f) a mold for forming a test specimen, and wherein said mold further comprises:

15 (i) a substantially flat base plate;

(ii) a centering plate mountable on said base plate; and

(iii) a first specimen support and a second specimen support mountable on said base plate and defining a gap between said centering plate and said specimen supports for accommodating said test specimen; and

20 (g) an environmental chamber for controlling the temperature to which said device and said materials are exposed.

12. A method for characterizing a material, comprising the steps of:

(a) creating a ring-shaped specimen of a said material;

25 (b) placing said specimen around a metal ring having at least one strain gauge attached to said ring such that said specimen is in contact with said ring;

(c) attaching said strain gauge to a processor for gathering and processing information from said strain gauge;

(d) placing the specimen and said metal ring inside of an environmental chamber;

30 (e) lowering the temperature of said environmental chamber until said specimen cracks;

(f) utilizing said processor to process said information from said stain gauge.

13. The method of claim 12, further comprising the step of attaching a thermocouple to said ring and to said processor.

5 14. The method of claim 12, further comprising the step of attaching said strain gauge to a module for amplifying the signal of said strain gauge prior to attaching said strain gauge to said processor.

10 15. The method of claim 13, further comprising the step of attaching said thermocouple to a module for amplifying the signal of said thermocouple prior to attaching said thermocouple to said processor.

16. The method of claim 12, wherein said construction material is asphalt binder.

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